

Supplementary Table 1. Pearson correlation coefficients between macronutrient (carbohydrate, fat, and protein) and total energy intake

| | Carbohydrate | Fat | Protein | Total energy intake |
|---------------------------------------|---------------------|------------|----------------|----------------------------|
| Carbohydrate (%) | 1.00 | -0.58 | -0.36 | 0.36 |
| Fat (%) | -0.58 | 1.00 | 0.69 | -0.49 |
| Protein (%) | -0.36 | 0.69 | 1.00 | -0.38 |
| Total energy intake (kcal/day) | 0.36 | -0.49 | -0.38 | 1.00 |

Analysis was conducted in the following units: total energy intake, kcal/day; and macronutrient intake, % of total energy intake.

All correlations between variables were significant ($P < 0.001$).

Supplementary Table 2. Associations between PA and fasting blood glucose level by quartiles of macronutrient (carbohydrate, fat, and protein) intake

| | Model 1* | | | Model 2† | | |
|--------------------------|----------|---------|----------------------------------|----------|---------|----------------------------------|
| | β | SE | P _{trend} | β | SE | P _{trend} |
| Carbohydrate (%) | | | | | | |
| Q1 (31.4–53.3) (lowest) | 0.00614 | 0.01365 | 0.653 | 0.00213 | 0.01339 | 0.873 |
| Q2 (53.3–56.7) | 0.02503 | 0.01308 | 0.056 | 0.02449 | 0.01283 | 0.056 |
| Q3 (56.7–59.8) | -0.00886 | 0.01211 | 0.465 | -0.00909 | 0.01188 | 0.444 |
| Q4 (59.8–70.7) (highest) | -0.03892 | 0.01087 | <0.001 | -0.03401 | 0.01067 | 0.001 |
| | | | P _{interaction} = 0.001 | | | P _{interaction} = 0.004 |
| Fat (%) | | | | | | |
| Q1 (9.2–19.5) (lowest) | -0.01683 | 0.01112 | 0.130 | -0.01039 | 0.01091 | 0.341 |
| Q2 (19.5–23.4) | -0.01453 | 0.01233 | 0.238 | -0.01390 | 0.01210 | 0.251 |
| Q3 (23.4–27.4) | 0.01056 | 0.01299 | 0.416 | 0.00584 | 0.01274 | 0.647 |
| Q4 (27.4–50.9) (highest) | -0.00665 | 0.01306 | 0.611 | -0.01039 | 0.01282 | 0.418 |
| | | | P _{interaction} = 0.388 | | | P _{interaction} = 0.677 |
| Protein (%) | | | | | | |
| Q1 (8.0–11.5) (lowest) | -0.03156 | 0.01136 | 0.006 | -0.02224 | 0.01115 | 0.046 |
| Q2 (11.5–12.6) | -0.00628 | 0.01225 | 0.608 | -0.00725 | 0.01202 | 0.546 |
| Q3 (12.6–13.8) | 0.01336 | 0.01302 | 0.305 | 0.00848 | 0.01278 | 0.507 |
| Q4 (13.8–22.3) (highest) | -0.00154 | 0.01258 | 0.903 | -0.00567 | 0.01235 | 0.646 |
| | | | P _{interaction} = 0.058 | | | P _{interaction} = 0.332 |

Regression analysis was conducted in the following units: PA, METs×hour/day; blood glucose level, mg/dl; and macronutrient intake, % of total energy intake.

* Model 1: Adjusted for age, sex, study area, total energy intake, amount of alcohol consumption and smoking, and medication for hypertension or hypercholesterolemia.

† Model 2: Adjusted for Model 1 + BMI.

PA, physical activity; Q, quartile; β , regression coefficient; and BMI, body mass index.

Supplementary Table 3. Associations between macronutrient (carbohydrate, fat, and protein) intake and HbA1c level by quartiles of PA

| | | Model 1* | | | Model 2† | | |
|-------------------------|---------------------------|----------------------------------|---------|--------------------|----------------------------------|---------|--------------------|
| | | β | SE | P _{trend} | β | SE | P _{trend} |
| Carbohydrate (%) | | | | | | | |
| PA | Q1 (0.0–4.9) (lowest) | 0.00694 | 0.00072 | <0.001 | 0.00624 | 0.00071 | <0.001 |
| | Q2 (4.9–10.5) | 0.00365 | 0.00076 | <0.001 | 0.00317 | 0.00075 | <0.001 |
| | Q3 (10.5–20.5) | 0.00405 | 0.00074 | <0.001 | 0.00369 | 0.00073 | <0.001 |
| | Q4 (20.5–112.4) (highest) | 0.00246 | 0.00074 | <0.001 | 0.00243 | 0.00072 | <0.001 |
| | | P _{interaction} < 0.001 | | | P _{interaction} < 0.001 | | |
| Fat (%) | | | | | | | |
| PA | Q1 (0.0–4.9) (lowest) | -0.00220 | 0.00071 | 0.002 | -0.00236 | 0.00070 | <0.001 |
| | Q2 (4.9–10.5) | 0.00157 | 0.00074 | 0.033 | 0.00132 | 0.00072 | 0.068 |
| | Q3 (10.5–20.5) | 0.00022 | 0.00072 | 0.759 | -0.00009 | 0.00071 | 0.893 |
| | Q4 (20.5–112.4) (highest) | 0.00245 | 0.00070 | <0.001 | 0.00145 | 0.00069 | 0.036 |
| | | P _{interaction} < 0.001 | | | P _{interaction} < 0.001 | | |
| Protein (%) | | | | | | | |
| PA | Q1 (0.0–4.9) (lowest) | -0.00319 | 0.00231 | 0.166 | -0.00483 | 0.00227 | 0.033 |
| | Q2 (4.9–10.5) | 0.00773 | 0.00237 | 0.001 | 0.00657 | 0.00234 | 0.005 |
| | Q3 (10.5–20.5) | 0.00223 | 0.00227 | 0.328 | 0.00100 | 0.00224 | 0.657 |
| | Q4 (20.5–112.4) (highest) | 0.00540 | 0.00219 | 0.013 | 0.00188 | 0.00215 | 0.383 |
| | | P _{interaction} = 0.004 | | | P _{interaction} = 0.004 | | |

Regression analysis was conducted in the following units: macronutrient intake, % of total energy intake; HbA1c, %; and PA, METs×hour/day.

* Model 1: Adjusted for age, sex, study area, total energy intake, amount of alcohol consumption and smoking, and medication for hypertension or hypercholesterolemia.

† Model 2: Adjusted for Model 1 + BMI.

HbA1c, hemoglobin A1c; PA, physical activity; Q, quartile; β , regression coefficient; and BMI, body mass index.

Supplementary Table 4. Adjusted means of HbA1c in joint analyses of PA and macronutrient (carbohydrate, fat, and protein) intake

| | PA | | | | | | β | P _{trend} |
|--------------------------|---------------|-------------|---------------|-------------|---------------|-------------|---------|----------------------------------|
| | Q1 (lowest) | | Q2 | | Q3 (highest) | | | |
| | Adjusted mean | 95% CI | Adjusted mean | 95% CI | Adjusted mean | 95% CI | | |
| Carbohydrate (%) | | | | | | | | |
| Q1 (31.4–53.3) (lowest) | 5.433 | (5.42–5.45) | 5.444 | (5.43–5.46) | 5.442 | (5.43–5.46) | 0.001 | 0.825 |
| Q2 (53.3–56.7) | 5.466 | (5.45–5.48) | 5.469 | (5.46–5.48) | 5.466 | (5.45–5.48) | 0.003 | 0.621 |
| Q3 (56.7–59.8) | 5.476 | (5.46–5.49) | 5.470 | (5.46–5.48) | 5.463 | (5.45–5.48) | -0.004 | 0.423 |
| Q4 (59.8–70.7) (highest) | 5.518 | (5.50–5.53) | 5.479 | (5.46–5.49) | 5.486 | (5.47–5.50) | -0.015 | 0.019 |
| | | | | | | | | P _{interaction} = 0.016 |
| Fat (%) | | | | | | | | |
| Q1 (9.2–19.5) (lowest) | 5.497 | (5.48–5.51) | 5.451 | (5.44–5.47) | 5.451 | (5.44–5.47) | -0.017 | 0.010 |
| Q2 (19.5–23.4) | 5.472 | (5.46–5.49) | 5.470 | (5.46–5.48) | 5.467 | (5.46–5.49) | -0.004 | 0.518 |
| Q3 (23.4–27.4) | 5.467 | (5.45–5.48) | 5.471 | (5.46–5.49) | 5.468 | (5.45–5.48) | 0.002 | 0.718 |
| Q4 (27.4–50.9) (highest) | 5.458 | (5.44–5.47) | 5.471 | (5.46–5.49) | 5.468 | (5.45–5.48) | 0.003 | 0.592 |
| | | | | | | | | P _{interaction} < 0.001 |
| Protein (%) | | | | | | | | |
| Q1 (8.0–11.5) (lowest) | 5.481 | (5.47–5.50) | 5.444 | (5.43–5.46) | 5.449 | (5.43–5.46) | -0.017 | 0.005 |
| Q2 (11.5–12.6) | 5.476 | (5.46–5.49) | 5.469 | (5.45–5.48) | 5.474 | (5.46–5.49) | -0.002 | 0.744 |
| Q3 (12.6–13.8) | 5.472 | (5.45–5.48) | 5.472 | (5.46–5.49) | 5.475 | (5.46–5.49) | 0.008 | 0.135 |
| Q4 (13.8–22.3) (highest) | 5.472 | (5.46–5.49) | 5.475 | (5.46–5.49) | 5.461 | (5.46–5.48) | -0.005 | 0.275 |
| | | | | | | | | P _{interaction} = 0.020 |

Regression analysis was conducted in the following units: PA, METs×hour/day; HbA1c, %; and macronutrient intake, % of total energy intake.

Adjusted for age, sex, study area, total energy intake, amount of alcohol consumption and smoking, medication for hypertension or hypercholesterolemia, and BMI.

HbA1c, hemoglobin A1c; PA, physical activity; Q, quartile; CI, confidence interval; and BMI, body mass index.

Supplementary Table 5. Associations between PA and HbA1c level by quartiles of macronutrient (carbohydrate, fat, and protein) intake in participants with diabetes

| | Model 1* | | | Model 2† | | |
|--------------------------|----------|---------|----------------------------------|----------|---------|----------------------------------|
| | β | SE | P _{trend} | β | SE | P _{trend} |
| Carbohydrate (%) | | | | | | |
| Q1 (25.2–53.9) (lowest) | -0.00177 | 0.00334 | 0.596 | -0.00171 | 0.00333 | 0.608 |
| Q2 (53.9–57.9) | -0.00080 | 0.00323 | 0.804 | -0.00031 | 0.00321 | 0.924 |
| Q3 (56.9–61.4) | 0.00183 | 0.00320 | 0.567 | 0.00206 | 0.00319 | 0.519 |
| Q4 (61.4–71.3) (highest) | 0.00131 | 0.00292 | 0.655 | 0.00162 | 0.00291 | 0.577 |
| | | | P _{interaction} = 0.831 | | | P _{interaction} = 0.821 |
| Fat (%) | | | | | | |
| Q1 (8.8–17.6) (lowest) | -0.00287 | 0.00291 | 0.325 | -0.00249 | 0.00290 | 0.392 |
| Q2 (17.6–21.1) | 0.00082 | 0.00337 | 0.808 | 0.00112 | 0.00336 | 0.740 |
| Q3 (21.1–25.4) | 0.00271 | 0.00311 | 0.383 | 0.00329 | 0.00310 | 0.289 |
| Q4 (25.4–62.8) (highest) | 0.00078 | 0.00331 | 0.814 | 0.00057 | 0.00330 | 0.863 |
| | | | P _{interaction} = 0.593 | | | P _{interaction} = 0.576 |
| Protein (%) | | | | | | |
| Q1 (7.9–11.0) (lowest) | -0.00455 | 0.00297 | 0.126 | -0.00414 | 0.00296 | 0.162 |
| Q2 (11.0–12.2) | 0.00216 | 0.00305 | 0.479 | 0.00219 | 0.00303 | 0.471 |
| Q3 (12.2–13.6) | -0.00173 | 0.00326 | 0.596 | -0.00094 | 0.00325 | 0.772 |
| Q4 (13.6–24.3) (highest) | 0.00622 | 0.00340 | 0.067 | 0.00600 | 0.00339 | 0.077 |
| | | | P _{interaction} = 0.083 | | | P _{interaction} = 0.123 |

Regression analysis was conducted in the following units: PA, METs×hour/day; HbA1c, %; and macronutrient intake, % of total energy intake.

* Model 1: Adjusted for age, sex, total energy intake, amount of alcohol consumption and smoking, and medication for hypertension or hypercholesterolemia.

† Model 2: Adjusted for Model 1 + BMI.

PA, physical activity; HbA1c, hemoglobin A1c; Q, quartile; β , regression coefficient; and BMI, body mass index.